Amendments to the Specification

At page 4, line 12 through page 6, line 6, please delete the paragraphs as indicated below.

~~The present invention relates to an optical gas sensor, more specifically to a non-dispersive infrared (NDIR) gas sensor.~~

~~There are two ways of measuring CO_2 concentration. One is NDIR system, and the other is solid electrolyte system as disclosed, for example, in "A carbon dioxide gas sensor based on solid electrolyte for air quality control" in *Sensors and Actuators B*. vol. 66, pp. 55-66, 2000 by K. Kaneyasu, *et al.*~~

~~Although the solid electrolyte sensor is less expensive than the NDIR sensor, the NDIR sensor is preferable in terms of long-term stability, high accuracy and low power consumption, etc. Also, the NDIR sensor has good selectivity and sensitivity since it employs the physical sensing principle that an objective gas absorbs infrared of a certain wavelength.~~

~~The optical characteristics of the NDIR sensor are as follows.~~

~~Generally, the light intensity is decreased or increased by diffraction, reflection, refraction and absorption of light on the optical path. As for an NDIR sensor, as the incident light passes through the optical path, a gas on the optical path absorbs it and the initial light intensity becomes decreased.~~

~~When the gas concentration (J) is isotropic and distributed uniformly on the optical path, and infrared light passes through the optical path (L), the final light intensity (I) can be explained by the Beer-Lambert's law, which is the function of the gas absorption coefficient (k), path length (L) and initial light intensity (I_O).~~

~~That is,~~ $\cancel{I = Io \cdot e^{-kJL(x)}}$ ~~———— Equation (5)~~

~~The Beer Lambert's law is expressed as the above Equation (5). If the initial optical intensity (I_O) and the absorption coefficient (k) of a gas to be measured are constant, the final light intensity (I) is expressed as a function of the gas concentration (J) on the optical path and the path length (L).~~

~~If there is no gas to be measured in the above Equation (5), i.e., if J=0, the final light intensity becomes equal to the initial light intensity.~~

~~That is,~~ $\cancel{I = Io}$ ~~---------- Equation (6)~~

~~Hence, the difference of the light intensities between when there is no gas to be measured and when the gas concentration is J is obtained by Equation (7).~~

$\cancel{\Delta I = Io \cdot (1\text{-}e^{-kJL(x)})}$ ~~---------- Equation (7)~~

~~However, since the conventional infrared sensor outputs a voltage in proportion to the light intensity, the output of the sensor according to the existence or non-existence of a gas is expressed as Equation (8).~~

$\cancel{\Delta V = \alpha \cdot \Delta I = \alpha \cdot [Io \cdot (1\text{-}e^{-kJL(x)})]}$ ~~---------- Equation (8)~~

~~where,~~ $\cancel{\alpha}$ ~~is a proportional constant.~~

~~In order to produce an optical gas sensor having a broad range of measurement from low concentration to high concentration, first, an optical cavity (or a gas chamber) having long path (L) should be provided; second, an infrared sensor of which the lowest limit of the detectable light intensity (I_{th}) is sufficiently low should be used; and third, an infrared sensor having a saturation light intensity (I_{sat}) which is relatively high and slightly smaller than the initial light intensity (I_O) radiated from an infrared source.~~

~~However, the commercially available infrared detecting sensors (e.g., Thermopile IR sensor or Passive IR sensor) are not enough to satisfy all of the above conditions, an advantageous method of providing an optical cavity having long path is required.~~

At page 6, line 25 through page 7, line 8, please delete the paragraphs as indicated.

~~Particularly, the method proposed by Martin relates to an optical gas sensor cell structure comprising three concave reflection surfaces and applying the White's cell concept of setting the focus of reflected light on or adjacent to the opposite reflection surface. This method has an advantage of simply providing a relatively long optical path compared with other methods.~~

~~However, since the incident light, which is radiated from an optical source located on the surface of a main mirror (a mirror of one body) through an optical cavity, may have slight changes in its incident angle, it was difficult to determine the appropriate location of the optical sensor.~~

At page 8, lines 12-17, please amend the paragraphs as follows:

The gas openings comprise a gas vent established at a certain wall of the gas chamber and a plurality of gas diffusion ~~halls~~<u>holes</u> disposed on the lower or upper support plate of the gas chamber.

The plurality of gas diffusion ~~halls~~<u>holes</u> is covered by a gas filter.

The plurality of gas diffusion ~~halls~~<u>holes</u> is preferably disposed on the axis of the incident light from the infrared sensor.

At page 18, lines 4-7, please delete the paragraph as indicated below.

~~Although the present invention has been described with reference to particular embodiments, the description is only an example of the present invention. Various adaptations and combinations of features of the embodiments disclosed are within the scope of the invention as defined by the accompanied claims.~~

At page 18, lines 8-23, please amend the paragraphs as follows:

~~The~~ Further object of the present invention is to produce an optical cavity for non-dispersive infrared gas sensor, comprising two concave mirrors which are opposed to each other, of which the section is a circular arc, of which the central point is located on the same axis, and which are optically closed except for an inlet for establishing an optical source, an outlet for establishing a light detector and gas inlet/outlets.

Also, ~~the~~ further object of the present invention can be achieved by a non-dispersive infrared gas sensor comprising an optical source for irradiating infrared; a light detector for ultimately detecting light from the optical source; an optical cavity which is formed by two opposing concave mirrors of which the cross-section is a circular arc, of which the central point is located on the same axis, and which are optically closed except for the inlet for establishing an optical source and the outlet for establishing a light detector and gas in/outlets; an optical modulating part having a pulse modulation time of 200-600 ms and turn-off time of 2, 2.5 and 3 sec. for controlling the light irradiated from the optical source; and an amplification part for amplifying an electrical signal from the light detector.

Hereinafter, further aspects of the present invention will be further explained with

reference to the drawings illustrated in the embodiments of the present invention. Basically, the optical cavity of the present invention is produced by circular arcs.

At page 21, line 8, please amend the paragraph as follows:

Fig. 17 shows the feature of parallel light irradiated from optical source being ~~condensed~~integrated to a certain point. In other words, if light is irradiated from the optical source existing at a predetermined position to be parallel to the optical axis on which central points of the circular arcs are located, and reflected twice, it is focused adjacent to the infrared sensor located on the mirror opposite to the optical source, thereby increasing the output voltage of the infrared sensor.

At page 25, line 21, please amend the paragraph as follows:

For example, in order to obtain the parallel light of the present invention, another method of producing a parabolic type mirror in an optical cavity can be employed for production of a cost-effective optical cavity, and the present invention can be implemented using laser source having a predetermined wavelength without the use of the ~~product from Gilway technical lamp.~~ IR lamp from Gilway™.